

Periscope.

PHYSIOLOGY (INCLUDING EXPERIMENTAL PHYSIOLOGY) OF NERVOUS SYSTEM.

On the Nature of Glomerular Activity in the Kidney.

By J. G. ADAMI, *Foster's Journal*, vol. vi., No. 6.—As is well known the secretory activity of the kidney has been explained in two ways: the one, the mechanical theory; the other, the vital theory. Mr. Adami has attempted by a series of experiments to arrive nearer the truth about the matter. Nussbaum states that fishes, batrachia, ophidia, have a double renal supply: first, renal arteries running specially to the glomeruli; second, by the vena renalis advehens, or renal portal vein and the lumbar veins.

These, by their branches, aided by the vasa efferentia from the glomeruli, form the capillary network around the tubuli uriniferi. Hence, if, in the frog or newt, the renal arteries are ligatured, circulation through the glomeruli is wholly stopped. Hence, in these animals we would seem to have a means of determining the place of secretion of normal and abnormal constituents of the urine; and taking advantage of this arrangement. Nussbaum endeavored to determine the constituents of the urine which are secreted by the glomeruli and by the convoluted tubes respectively. He found that when the arteries were ligatured sugar, peptone, egg-albumin, and carmine, injected into the vascular system, did not appear in the urine, this being contrary to what is observable in the normal animal; on the other hand, urea similarly injected into the ligatured animal, still made its appearance in the urine. Hence he concluded that sugar, peptone, egg-albumen, and carmine, when present in the urine, have been passed out through the glomeruli, whereas urea is secreted through the cells of the tubules. Mr. Adami found that after closure of the renal arteries the glomeruli are not completely cut off from the circulation. Judging from his experiment with laky blood, the glomerular activity is not dependent on blood pressure, but on secretory activity; that the hypothesis of Heidenhain is correct; that the glomerular epithelium, the epithelial capsule ensheathing the Malpighian knot of vessels, has powers of a selective secre-

tory nature. Nussbaum's assumptions as to the nature of the renal secretion are based, as stated above, upon the premise that after ligation of the arteries the Malpighian vascular knots are cut off from the circulation. Adami having found that in spite of breaking off the arterial supply, blood would still seem to pass through at least some of the glomeruli, the question remains whether the conclusions that Nussbaum has drawn from the urea researches are correct? According to Heidenhain the capsule secretes water owing to its own iridescent secretory activity. This activity is excited by urea, which must pass with the blood to some of the glomeruli; hence the increased secretion of water by Nussbaum. Adami also found that diuretics, as sodium nitrate, owe their diuretic effect in part, if not wholly, to direct action on the glomerular epithelium, and not, as Nussbaum has thought to have shown and Heidenhain has considered possible, to its influence upon the cells of the tubuli.

Plethysmographic and Vaso-Motor Experiments with Frogs. By F. H. ELLIS, *Journal of Phys., Foster*, vol. vi., No. 6.—Drs. Bowditch and Warren have shown in the cat, by means of the plethysmograph, that slow, rhythmical, electrical stimulation of the peripheral end of the cut sciatic nerve of the curarized cat causes an immediate dilatation of the vessels of the leg evidenced by a rise in the plethysmographic tracing, while shocks of a certain greater degree of frequency cause an immediate contraction. Dr. Ellis has studied similar effects upon frogs. The results of Dr. Ellis' experiments point to the existence of a vaso-dilator as well as a vaso-constrictor mechanism in the frog. The vaso-motor mechanism is not so active in cold-blooded animals as in warm, and therefore he is not surprised to obtain dilatation in the vessels of the leg of a frog with greater difficulty than was experienced by Bowditch and Warren in producing the same result in the leg of the cat.

Spinal Vaso-Motor Nerves. By Dr. WATERS, *Foster's Journal*, vol. vi., No. 6.

Dr. Waters has made a series of experiments upon the vaso-motor functions of the spinal nerves of the frog. He wished to ascertain whether the distribution of vaso-motor nerves in the various regions of the frog's alimentary canal bore any distinct relation to the different spinal nerves as they are given off from the spinal cord.

From the results thus obtained, I feel justified in concluding that the blood-vessels in separate areas of the alimentary canal are governed by vaso-constrictor fibres, which travel along distinct and determinable spinal nerves, each spinal nerve conveying fibres for a certain area.

ISAAC OTT.